REMARKS/ARGUMENTS

The amendments set out above and the following remarks are responsive to the points raised by the Office Action dated December 15, 2005. In view of the amendments set out above and the following remarks, reconsideration is respectfully requested.

The Pending Claims

Claims 5-6 and 16-20 are cancelled, and claims 21-23 have been added, so that claims 1-4, 7-15, and 21-23 are pending.

Claims 1, 4, 7, and 12 have been amended, and claims 21-23 have been added, to describe the invention more clearly. Indentations have been added to claims 7 and 12 to improve readability. No new matter has been added, and the basis for the amended claim language may be found within the original specification, claims, and drawings.

The amendments to claims 4, 7 and 12 are supported at, for example, paragraphs [0044] and [0060] and by original claim 4. New claim 21 recites limitations formerly recited in independent claim 1 and is supported by, for example, original claim 5. New claim 22 is supported at, for example, paragraphs [0061] and [0067]. New claim 23 is supported at, for example, paragraph [0068]. Entry of the above is respectfully requested.

Objection to the Drawings

The drawings were objected to under 37 C.F.R. § 1.83(a) on the grounds that the anchoring element of the ship extending in a plane perpendicular to the stiffener as set forth in claim 9 is not shown in the Figures.

As mentioned in the specification at paragraph [0074], the anchoring element is shown in Figure 7 as element 62.

Because the anchoring element as claimed in claim 9 is shown in Figure 7 as element 62, it is respectfully submitted that the drawings meet the requirement of § 1.83(a). Accordingly, the Applicants respectfully request that the objection be withdrawn.

Claim Rejections under 35 U.S.C. §§ 102 and 103

Claims 1-4 and 12-20 were rejected under 35 U.S.C. § 102 as anticipated by U.S. Patent No. 6,237,303 to Allen et al. (hereinafter, "Allen").

Claims 7-12, 14 and 15 were rejected under 35 U.S.C. § 103 as unpatentable over U.S. Patent No. 3,941,272 to McLaughlin (hereinafter, "McLaughlin").

Each of these rejections is separately and respectfully traversed.

Claim 1 recites a mechanically welded structure comprising, *inter alia*, a first structural element and a second structural element welded to the straight edge of the first structural element. Claim 1 further recites that the first structural element has a stress-relieving slit having two opposite ends, and circular holes at the two opposite ends, and that the first structural element is reinforced around the circular holes by backing plates.

The Office Action characterized column web 20 of Allen as a first structural element, beam 12 as a second structural element attached to a straight edge of the first structural element, and slot 44 as a stress-relieving slit. According to the Office Action, Figure 3 of Allen shows backing plates (16, 18) located in the vicinity of the circular holes and which are providing reinforcement to the first structural element. The Office Action indicates that the claim limitation "around" has been broadly interpreted to mean "in the vicinity of."

Anticipation requires that the cited reference disclose each and every element of the claims. Allen does not anticipate independent claim 1 because Allen does not disclose a first structural element reinforced around the circular holes by backing plates, as claimed in claim 1.

The plates of Allen do not reinforce the first structural element around the circular holes because the plates are too far removed from the holes. In Allen, the vertical plates 16 and 18 are connected to the horizontal plates 32 and 34, respectively. Due to their trapezoidal shapes, plates 32 and 34 are separated from the slot 44 (Figure 3; column 10, lines 15-17). Since the plates 32, 34, 16 and 18 do not even contact the slot 44 or the circular holes of the slot 44, they cannot reinforce the column web 20 around the circular holes of slot 44, as claimed in claim 1. In fact, Allen teaches at column 8, lines 58-60 that the vertical plates 16 and 18 function to average out the magnitude of stress measured across the beam connection 14, in contrast to providing any reinforcement around the circular holes of the slot 44. Allen teaches that the construction of the connection 14 in this manner evenly distributes the magnitude of stress across the weld to ensure that the connection 14 does not fracture across the column flange 28 during loading conditions (col. 8, lines 63-67). Thus, the plates 16, 18, 32 and 34 in Allen are not reinforcing the first structural element around the circular holes of the slot 44, as claimed in claim 1, but are stiffening the whole junction of column web 20 and beam 12. Because Allen does not teach a structural element reinforced around the circular holes by backing plates, as claimed in independent claim 1, the rejection under § 102 cannot be maintained.

Moreover, dependent claim 23 is also patentable over the cited references. None of the cited references disclose backing plates in the form of a ring having a central opening aligned with the circular holes of the stress-relieving slit, as claimed in new dependent claim 23. Accordingly, dependent claim 23 is patentable over the cited references.

Independent claim 12 is also patentable because Allen does not disclose every element of amended independent claim 12. Amended claim 12 recites that the first structural element has, perpendicular to the direction of the straight edge, a first dimension at the location of the point at which the force is exerted. Amended claim 12 further recites that the stress-relieving slit has, according to the direction of the straight edge, a length greater than the first dimension. According to the Office Action, the first dimension of the column web 20 is measured as the thickness of the center portion of the column web (hatched portion), as measured from the edge touching plate 32 to the edge touching plate 34 (annotated Figure 3 in the Office Action).

Measuring the first dimension of the first structural element in this way, however, directly contravenes amended claim 12. Amended claim 12 recites that the first dimension is perpendicular to the straight edge. Amended claim 12 further recites that the straight edge is welded to a second structural element (or an intermediate element). Furthermore, amended claim 12 recites that the stress-relieving slit extends parallel to the straight edge. In other words, the first dimension is measured perpendicular to the straight edge to which the second element is welded and along which straight edge the slit extends. Thus, with reference to Figure 4 of Allen, the straight edge is the lengthwise edge of column web 20 parallel to the slot 44 (measured going along the vertical length of column 20) and which is attached to beam 12. Perpendicular to this straight edge is a dimension going across the column web perpendicular to the slot 44.

Once the first dimension is measured according to amended claim 12, it can be seen that Allen does not disclose a slit having the claimed length. As shown, e.g., in Figures 1, 2, 4, 9, 13, 14, and 15 of Allen, the length of the slot 44 in the direction of the straight edge is not longer than the dimension of the column measuring perpendicular to the straight edge. This contrasts to the dimensions required in amended claim 12, which are best illustrated, e.g., in Figures 1, 4, 5, and 7 of the present specification. Figures 1, 4, 5, and 7 of the present application show that, unlike Allen, the claimed slit has a length according to the direction of the straight edge that is greater than the dimension of the first structural element that is perpendicular to the straight edge, as claimed in amended claim 12.

The claimed slit reduces stress by allowing a maximum deformation of the proximal edge of the slit (specification, paragraph [0053]). This flexibility of the slit is made possible because the stress-relieving slit has a longitudinal length greater than the first dimension, as claimed (specification, paragraphs [0059] and [0060]). Moreover, measuring the first dimension according to the Office Action could lead to an opening having the shape of a hole which cannot be considered to be a slit extending parallel to the straight edge.

Thus, because Allen does not disclose a slit having the claimed length, Allen does not disclose all of the limitations of amended claim 12. Accordingly, the § 102 rejection of amended claim 12 cannot be maintained.

A *prima facie* case of obviousness requires that the cited references teach or suggest all of the elements of the claims (MPEP § 2143). According to the Office Action, McLaughlin shows a transport ship having a hull, a cell delimited by partitions connected to the hull, and a liquefied gas storage tank. The Office Action also alleges that the stress-relieving slit is longer than the width of the first structural element. According to the Office Action, McLaughlin shows a stiffener having a slit extending parallel to the straight edge and situated facing the point at which the force is exerted by the vertical anchoring element. Because McLaughlin does not teach or suggest all of the elements of amended independent claims 7 and 12, the § 103 rejection cannot be maintained.

Amended claims 7 and 12 recite that at least one edge of the stress-relieving slit flexes to allow the stress-relieving slit to open in response to the force. McLaughlin does not teach or suggest a slit flexing to allow the slit to open in response to the force. Instead, McLaughlin teaches that the longitudinal and horizontal stiffeners and the transverse bulkheads 54 can be provided with perforations 50 in order to enhance the circulation of air and to provide an overall honeycomb-like structure (column 3, lines 35-43). The air circulation helps to dissipate heat and maintain a uniform temperature so that the steel of the hull and the composite transition elements will remain relatively unaffected by the cold temperature of the compressed gas cargo (column 3, lines 44-53; column 6, line 50-column 7, line 17). There is no teaching or suggestion of the perforations 50 of McLaughlin flexing to open in response to force. In fact, by circulating the air to keep the temperature uniform between the hull and the tank, McLaughlin seems to be concerned with protecting the steel from undergoing any temperature-induced effects in the first place, instead of providing a mechanism to respond to a temperature-induced effect when it occurs, such as expansion and contraction. This is what the flexing, stress relieving slit of the present claims accomplishes (specification, paragraphs [0008]-[0010], [0012], [0049]). There is no teaching or suggestion in McLaughlin that would lead one of ordinary skill in the art to provide a mechanically welded structure including a stress-relieving slit, at least one edge of the stress-relieving slit flexing to allow the stress-relieving slit to open in response to force, as claimed. Accordingly, the § 103 rejection cannot be maintained.

Dependent claim 22 is allowable not only because it depends from allowable independent claim 7, but because it also defines limitations not taught or suggested in McLaughlin. Claim 22 recites a stress-relieving slit having two opposite ends, and circular holes at the two opposite ends, the circular holes having a diameter that is at least three times the width of the stress relieving slit, and that the first structural element is reinforced around the circular holes by backing plates. The perforations of McLaughlin do not have, at opposite ends of the perforation, circular holes having a diameter that is at least three times the width of the stress relieving slit, nor are they reinforced with backing plates. Accordingly, claim 22 is allowable, not only for the reasons set forth above, but additionally because McLaughlin does not teach or suggest all of the limitations of dependent claim 22.

Because the independent claims are allowable for the reasons set forth above, the remaining dependent claims are also allowable because they depend from the novel and non-obvious independent claims.

Conclusion

For the reasons set forth above, reconsideration is respectfully requested.

If, in the opinion of the Examiner, a telephone conference would expedite prosecution of the subject application, the Examiner is invited to call the undersigned attorney.

Respectfully submitted,

Stephanie M. Lawley

Stephanie M. Lawley, Reg. No. 55362
LEYDIG, VOIT & MAYER
700 Thirteenth Street, N.W., Suite 300
Washington, DC 20005-3960
(202) 737-6770 (telephone)
(202) 737-6776 (facsimile)

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